

ORR's annual report on HS1 Ltd 2013-2014



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1. Summary

1.1 This document comprises ORR's annual report on HS1 Ltd for the year 2013-14. Previous reports on HS1 Ltd are available from the [HS1 regulation page](#) of our website.

1.2 HS1 Ltd has a 30 year concession from the Secretary of State to operate and manage the HS1 network. ORR is the health and safety regulator for HS1 Ltd, and has economic regulation responsibilities through the Concession Agreement and the [Railways Infrastructure \(Access and Management\) Regulations 2005](#) ("the Regulations").

1.3 While HS1 Ltd is responsible for the overall management and operation of the HS1 network, the responsibility for the infrastructure itself is subcontracted to Network Rail (High Speed) Ltd ("NR(HS)").

1.4 HS1 Ltd has performed very well in the previous year, and we are pleased with the progress made – particularly with regard to the completion of the 2014 Periodic Review of HS1 Ltd.

1.5 This report focuses on key areas of HS1 Ltd's work, and our regulation of HS1 Ltd. Areas covered are:

- (a) the periodic review of HS1 Ltd;
- (b) performance and data monitoring;
- (c) track access;
- (d) asset management; and
- (e) safety.

1.6 Further questions or comments on this report should be directed to:

David Reed

Access Executive

Office of Rail Regulation

One Kemble Street

London

WC2B 4AN

E: david.reed@orr.gsi.gov.uk

T: 0207 282 3754

2. Periodic Review

2014 High Speed 1 Periodic Review (PR14)

2.1 The 2014 periodic review (“PR14”), is the first periodic review for HS1 Ltd, and covers the period from 1 April 2015 to 31 March 2020, control period 2 (“CP2”). We have a legal duty under Regulation 13 of the Regulations to ensure that HS1 Ltd is provided with incentives to reduce the cost of provision of infrastructure and level of access charges, through a periodic review of access charges.

2.2 HS1 Ltd launched its draft Five Year Asset Management Statement (“5YAMS”) consultation on 18 October 2013. The six week consultation period closed on 29 November 2013. Ten responses were received, and all of these are available in full on the [HS1 website](#). Throughout November and December 2013, further work was undertaken by HS1 Ltd to refine the content of the 5YAMS, reflecting consultee comments and questions. HS1 Ltd submitted the 5YAMS to us on 31 December 2013.

2.3 Following our review of HS1 Ltd’s 5YAMS, we consulted on our [draft determination](#) between 27 February and 4 April 2014. Our draft determination proposed to approve HS1 Ltd’s 5YAMS. Responses to this consultation can be found on the [ORR website](#).

2.4 Following this consultation, we approved HS1 Ltd’s 5YAMS on 9 May 2014. Our [approval document](#) sets out the process, challenge and outcomes of our PR14 review and approval in key areas, comprising HS1’s regulatory framework, its approach to asset management, its operations, corporate and pass-through costs, as well as other financial assumptions. Finally, we reviewed and approved the relevant elements of the track access charges for both passenger and freight operators.

2.5 HS1 Ltd’s 5YAMS was built upon a number of inputs, which represented a significant programme of work for both HS1 Ltd and NR(HS). HS1 Ltd commissioned top down and bottom up benchmarking studies, a traffic volume forecasting study and financial modelling, alongside a series of developments in their asset management knowledge, including Asset Specific Policies (“ASPs”), a whole life cost model and unit cost information. The quality of these inputs enabled HS1 Ltd to produce a 5YAMS that was of sufficient robustness to be signed off at the initial stage.

2.6 We worked robustly and collaboratively with HS1 Ltd, as well as their customers and stakeholders, throughout the PR14 process. We were pleased with the way in which these organisations reciprocated. HS1 Ltd’s engagement programme in particular was constructive, open and transparent and has helped to put them on a sure footing for the next five years of Control Period 2.

Summary of key PR14 findings

2.7 As part of our review, we considered HS1 Ltd's regulatory framework. We were content to accept HS1 Ltd's proposal that the existing performance thresholds and payments rates in the performance regime be retained, and we reviewed HS1 Ltd's cost allocation methodology and considered it to be appropriate. Through the 5YAMS HS1 Ltd had proposed a new outperformance sharing mechanism; we were content to approve this mechanism as it provides better incentives for HS1 Ltd and its customers to work together to reduce operating and maintenance costs.

2.8 We reviewed the HS1 Ltd asset management approach as part of PR14 and found it to be reasonable in terms of robustness and sustainability. The development of ASPs by HS1 Ltd and NR(HS) provides justification for the asset management approach applied in the 5YAMS and 40-year plans. We noted that asset condition on the HS1 network is broadly where we would expect it to be based on the age of the asset base and recognise the renewal interventions will begin to ramp up in CP4 as asset condition triggers renewal for 'medium' life assets. Further, we recognise the journey HS1 Ltd is on in improving asset knowledge and improving asset degradation models. Through the PR14 process it was demonstrable that there was a significant step forward in the development of whole life cycle cost models for the HS1 network. Based on the renewals profile that the whole life cost models produced we approved the escrow funding required to support this future programme.

2.9 As part of our review we considered the proposed operating costs for HS1 Ltd and NR(HS) in CP2. We approved HS1 Ltd's assumptions for contract costs, internal costs and pass through costs. We approved NR(HS)'s operations and corporate functions expenditure assumptions and the proposals for the management fee and risk premium, noting in particular NR(HS)'s positive response to our challenge regarding the level of management fee during the 5YAMS consultation.

2.10 We reviewed and approved HS1 Ltd's 5YAMS financial assumptions, including its approach to calculating the CP2 renewals charge. The annual renewals charge will increase from £5.9m in CP1 to £11.2m in CP2. However, on current expenditure and interest rate forecasts, the renewals charge will need to increase further to £16.4m in CP3 and £17.4m from CP4 onwards to recover the impact of underfunding in CP1, and to reflect the latest view of future renewals expenditure.

2.11 As part of PR14, we were required to approve HS1 Ltd's operating, maintenance and renewal costs and the track access charges flowing from these costs. We approved HS1 Ltd's proposed charges of £48.14 per train minute for international passenger services (12% lower than the equivalent CP1 charge) and £36.32 per train minute for domestic passenger services (13% lower than the equivalent CP1 charge). These charges are subject to re-opener provisions relating to the GSM-R upgrade and changes of +/-4% in traffic volumes.

2.12 Responding to comments from us and stakeholders, and in particular increasing its assumption of the number of freight trains that are expected to run on the HS1 network in CP2, HS1 Ltd reduced its freight charges relative to its draft 5YAMS, subject to a re-opener provision in the track access contracts. We approved HS1 Ltd's proposed charge of £5.36 per train-km, based on 800 trains per annum; this compares to £8.10 per train km for CP1.

2.13 For further details on our PR14 findings, please see the [PR14 webpage](#) and our [approval document](#).

The HS1 Ltd's network stations review

2.14 ORR, DfT and HS1 Ltd have met regularly to discuss both PR14 and the ongoing, DfT-led review of HS1 Ltd's stations, to ensure correct cost allocation and avoid duplication of work.

3. Performance and data monitoring

Overview

3.1 Monitoring of operational performance is conducted on receipt of the quarterly performance report, and HS1 Ltd's performance during 2013/14 has remained very good, with only 0.30% of services being delayed by HS1-attributable incidents.

3.2 Analysis of the delay minutes and incident data that HS1 Ltd began providing from the beginning of 2012/13 shows that it is a series of sporadic incidents across a range of assets that impact on services rather than any trend in failures of a particular asset.

Data assurance

3.3 We monitor HS1 Ltd's data to track performance against HS1 Ltd's obligations in the Concession Agreement. We therefore need assurance that the reported figures are both accurate and reliable.

3.4 Arup carried out the most recent data review in January 2014. The review incorporated a high level review of performance and asset management measures and a review of HS1 Ltd's Asset Register. The review included a confidence grading for both the accuracy and reliability of data and progress against recommendations made in the previous review in August 2011 on the breadth of data within the Asset Register.

3.5 The performance and asset management measures reviewed were:

- (a) total number of trains timetabled;
- (b) total number of trains delayed;
- (c) total number of trains delayed by an incident wholly or mainly attributable to HS1;
- (d) total number of trains delayed by an unidentifiable incident;
- (e) overall fault levels;
- (f) plan attainment (backlog);
- (g) track quality-induced speed restrictions;
- (h) broken rails; and

(i) service affecting defective rails.

3.6 All of these measures were assessed as A1* (the best attainable confidence grading). The source data review highlighted a single process weakness relating to the extraction of data for services delayed or cancelled for multiple reasons. A recommendation for improving this extraction has been made.

3.7 HS1 Ltd's Asset Register was regarded as comprehensive and accurate following the 2011 review but did not hold some important data, such as condition and criticality data. During the January 2014 review, HS1 Ltd showed clear evidence of significant progress in tackling these issues. The improvements include:

(a) more comprehensive track data;

(b) some data fields identified as mandatory;

(c) introduced Asset Quality arrangements to create an audit trail of activity; and

(d) on-going work to measure asset quality data and create a high level dashboard of indicators.

3.8 One recommended area which requires further work is in degradation rates and profiles.

3.9 All HS1 Ltd data assurance reviews are available on [our website](#).

Monitoring

3.10 Monitoring of train performance is achieved through quarterly and annual data returns that set out HS1 Ltd train service performance against key performance floor targets. Asset management is monitored in line with HS1 Ltd's Asset Management Strategy. The annual Asset Management Statement, along with asset stewardship key performance indicators, is used to assess HS1 Ltd's performance in maintaining its assets.

Performance

3.11 We monitor HS1 Ltd's operational performance against the performance floor measures set out in the Concession Agreement. The performance floor threshold sets out the minimum operational standards for HS1 Limited. Performance of HS1 Ltd is expected to be at a much higher level than the performance floor measures, which state that the proportion of services delayed by HS1 Ltd in a quarter should not exceed 15%. ORR raises any performance issues with HS1 Ltd well before it has fallen to these levels. A summary of performance for the financial year ending 31st March 2013 is provided here:

Figure 1 – HS1 performance in 2013/14

	Total number of trains timetabled	Total number of services delayed	Total number of services delayed (attributable to HS1)	Percentage of services delayed (attributable to HS1)	Total number of services delayed (unknown incident)
Domestic (St Pancras - NKL via Ebbsfleet)	27,591	1,303	73	0.26%	3
Domestic (St Pancras - Ashford)	26,326	1,679	69	0.26%	2
International	18,707	2,482	76	0.41%	-
Freight	286	110	2	0.70%	-
Total	72,910	5,574	220	0.30%	5

3.12 The proportion of trains delayed by HS1 Ltd-attributable incidents in 2013/14 was 0.30%, which is an improvement on the 0.35% recorded in 2012/13 and is the lowest percentage of services delayed in the last four years. It is also significantly better than the performance floor target.

Figure 2 - Delayed trains broken down by causes for which HS1 Ltd are wholly or mainly responsible

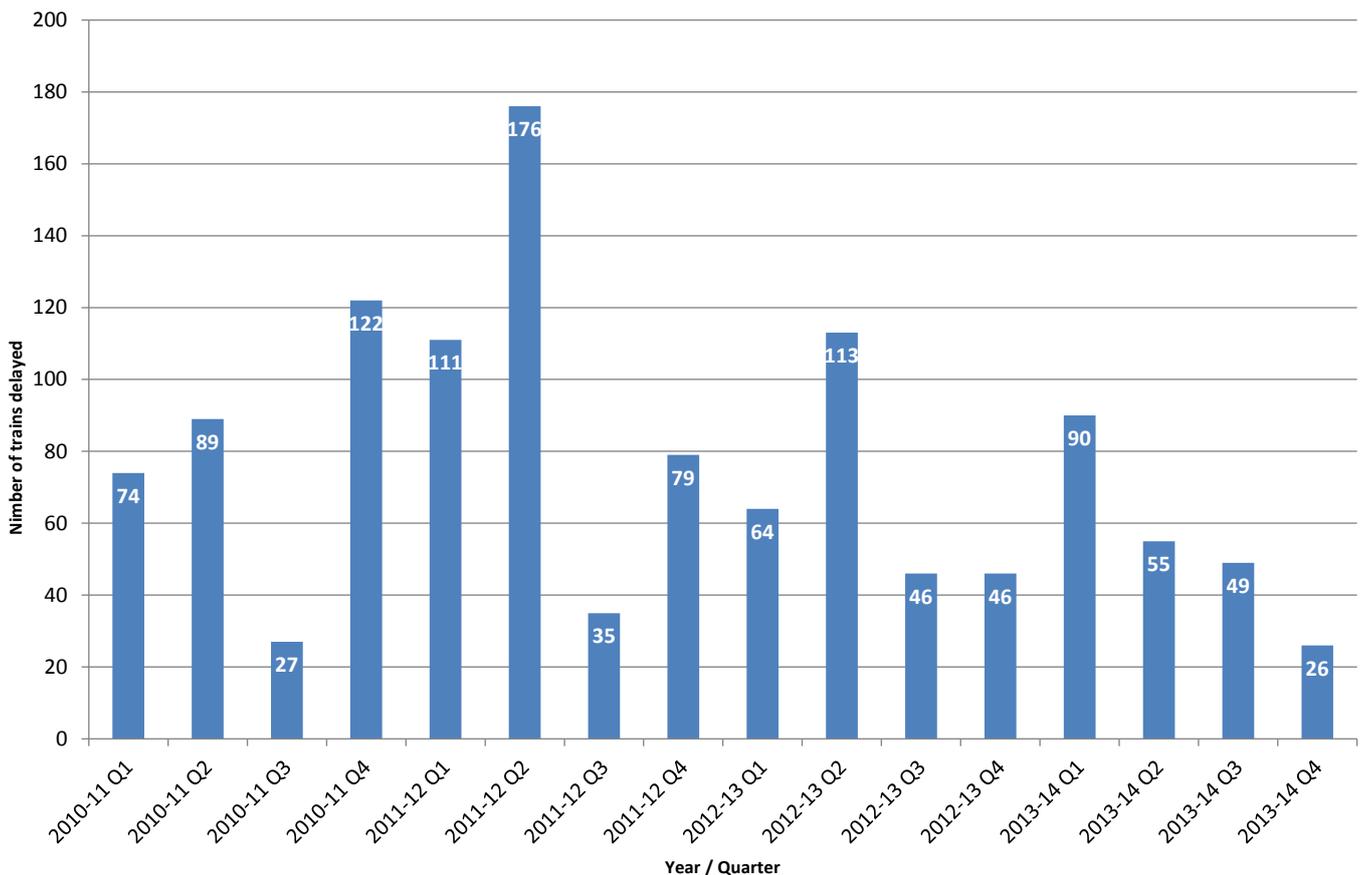
Category	Incident description	Total number of services delayed (attributable to HS1)			
		2010-11	2011-12	2012-13	2013-14
Track	TSRs due to condition of track	2	0	0	0
	Track Faults including Broken Rails	0	49	1	60
	Track (total)	2	49	1	60
Non-track assets	Points failures	10	4	115	13
	OLE/Third Rail faults	8	25	6	50
	Signal Failures	45	0	19	1
	Track Circuit Failures	88	38	17	5
	Signalling System & Power Supply Failures	13	12	6	0
	Other Signal Equipment Failures	10	0	0	2
	Telecoms failures	0	0	4	0
	Non-track assets (total)	174	79	167	71
Network management	Problems with trackside signs including TSR boards	0	1	2	0
	Other infrastructure	13	27	0	0
	Track Patrols & related possessions	0	0	1	1
	Possession overrun & related faults	4	37	4	4
	Other possession related delay	1	0	0	39
	Network Rail Operations - signalling	47	48	65	36
	Network Rail Operations - control	1	1	4	1
	Network Rail Operations - other	17	140	15	6
	Timetable Planning	6	15	10	0
	Network Rail commercial takeback/other	2	0	0	0
	Uninvestigated delay	0	4	0	0
Network management (total)	91	273	101	87	
Severe weather	Other weather	2	0	0	2
	Severe weather (total)	2	0	0	2
External fires	External fires	45	0	0	0
	External (total)	45	0	0	0
All	Grand total	314	401	269	220

3.13 Figure 2 shows the number of trains delayed by an incident wholly or mainly attributed to HS1 Ltd, displayed by cause. The largest cause of HS1 attributable delays was track faults (including broken rails) which accounted for 60 of the 220 delayed trains. All of these occurred in Q1 and were a consequence of a track fault at York Way South Junction, resulting in a 10kph speed restriction which affected both domestic and international services.

3.14 There were 71 trains delayed by non-track assets during 2013/14, a four-year low. The number of trains delayed by track circuit failures fell for the third year in succession and the biggest cause of delays was OLE/third rail faults which accounted for 50 trains across the first half of 2013/14 due to problems with overhead lines at St Pancras and between Stratford and Dagenham Dock.

3.15 The number of trains delayed by network management issues also fell to a four-year low with 87 trains delayed in 2013/14. The largest contributor was a possession related delay on 25th September at Crismill which was scheduled to end at 0530hrs but the extent of the overrun and introduction of single line working led to disruption to the morning peak.

Figure 3 - No of trains delayed wholly or partly due to HS1 Ltd, by quarter 2010/11 to 2013/14



3.16 Figure 3 shows the number of trains delayed by HS1 Ltd by quarter. The total in 2013/14 Q4 was the lowest in any quarter recorded since the beginning of 2010/11 and the 2013/14 total of 220 trains delayed was the lowest total in the last four years.

3.17 The number of trains delayed by sub-threshold delays in 2013/14 was 3991, down 2.4% since last year.

4. Track access

Overview

4.1 All new framework track access agreements for the HS1 network, and amendments to them, need our approval. These are contracts between HS1 Ltd and train operators which allow access to the HS1 network and provide for the reservation of capacity for more than one timetable period.

4.2 Train operators can appeal to us in respect of the terms for track access and more generally under the Regulations.

4.3 Throughout the year we have continued to deal in a timely manner with all access applications whilst working with HS1 Ltd to ensure that appropriate policies and associated documentation are in place. Against this background, HS1 Ltd continues to progress access arrangements to encourage utilisation of the network by both passenger operators (national and international) and freight operators.

London & South Eastern Railway Limited Framework Track Access Agreement

4.4 On 17 March 2014, ORR approved a new passenger Framework Track Access Agreement between HS1 Ltd and London & South Eastern Railway Limited (“LSER”) from 31 December 2014 to 31 December 2024. The purpose of this agreement is to allow the continuation of LSER domestic passenger services currently operating on the HS1 network for a duration of 10 years. Further details on the new agreement between HS1 Ltd and LSER can be found on the [ORR website](#).

Access rights reopener

4.5 In 2012, ORR informed stakeholders on the GB national network of the requirement for an access rights reopener provision for all track access contracts. This was done to ensure consistency with the requirements of the Regulations, and to strike a better balance between the needs of both infrastructure manager and operators, given the increasing scarcity of available capacity.

4.6 We have informed HS1 Ltd of our plans to implement this access rights reopener for the HS1 network once we have concluded on our work to implement it on the GB national network. HS1 Ltd is currently engaging openly on this matter, and recently attended a workshop on the GB national network reopener.

5. Asset Management

Overview

5.1 The Concession Agreement requires HS1 Ltd to secure the operation, maintenance, renewal, replacement and planning and carrying out of upgrades in accordance with best practice and in a timely, efficient and economical manner, to the greatest extent reasonably practicable having regard to all the circumstances.

Asset planning

5.2 HS1 Ltd and ORR agreed to defer the production of the updated Asset Management Annual Statement for 2013-14 on account of the documentation which supported its submission for the 5YAMS which largely contained the same level of detail.

5.3 HS1 Ltd completed its work on the final ASPs which were reviewed by ORR engineers as part of the PR14 submission. We found that the ASPs applied a sensible whole life cost approach which would not compromise the safety or sustainability of the assets over the 40 year period as defined in the Concession Agreement. Our findings highlighted a few areas for improvement including:

- (a) continuing to refine the understanding of the degradation rates of key assets;
- (b) adopting a risk-based maintenance approach;
- (c) exploring further opportunities for condition monitoring; and
- (d) adopting a systems engineering approach to optimise the management of the assets as opposed to 'silo-thinking' which is less efficient.

5.4 It is, however, recognised that overall performance is very good. Further details of our findings are available in the PR14 [approval document](#).

5.5 HS1 Ltd is continuing its negotiations with Network Rail Infrastructure Limited ("NRIL") concerning the installation of the GSM-R system to cover HS1 Ltd to comply with European requirements. The capital works for stages 1 and 2 have been agreed in principle and the on-going operations and maintenance costs are currently being resolved. A draft network change notice has been issued, the final version is expected to be finalised and issued by Summer 2014.

Asset condition

5.6 Track assets remain in good condition and are performing to the target set in Reliability Availability Maintainability (“RAM”) assessments for Section 1 and 2 of 99.9%, although isolated actionable defects do occur from time to time. This is true for both Plain Line and Switches & Crossings assets. The condition of assets is highly reliant on the inspection and maintenance regime. Generally, the track geometry remains in a good, stable condition with a small number of actionable defects recorded. Overall defect numbers have seen a downward trend since period 8 2012.

5.7 Signalling system assets are generally deemed to be in an acceptable condition and in line with that expected from assets in this early/mid phase of their lives. Exceptions are monitored through poor performance, picked up through periodic reporting processes. The phased introduction of the full timetable has meant that it has taken some time to identify the full range of issues with the signalling system. HS1 Ltd has implemented a number of initiatives which have addressed initial teething issues. As the equipment is quite reliable it is expected that the condition of the assets will be driven more by longer-term degradation, affecting the external trackside assets, such as signals and points equipment, more than those housed in equipment rooms and in the control centre which are driven more by obsolescence. HS1 Ltd is continuing with the development of condition KPIs for signalling assets.

5.8 Civil Engineering assets are considered in good condition as expected given the early phase of their lives. Quantitative asset condition data is collected for earthworks, drainage and fencing. A review of condition marking systems for tunnels has been undertaken with SNCF and NRIL. NR(HS) had undertaken a work stream in 2013/14 with NRIL to develop a new Tunnel Condition Marking Index (“TCMI”) handbook for segmental concrete tunnels which is expected to be completed in mid-2014. A further work stream is planned for quantitative asset condition scoring of structures.

5.9 Overhead line electrification (“OLE”) assets are generally in good condition which is in line with the age, environment and use within which they are operating. The geometry of the system is within tolerance as confirmed by regular measurement and the contact wire wear is considered to be very low.

Maintenance and renewals

5.10 Track assets are being managed on a time based inspection basis and through regular planned preventative maintenance, with any issues arising (based on specified tolerances) dealt with through corrective work orders. These frequencies are routinely assessed given wear trends, defects and the introduction of new rolling stock to ensure the inspections are commensurate with the asset condition and predicted wear. There are a couple of poor sections of ballast noted in section 1 which will be renewed in the control period 2. No major track interventions are expected until control period 7.

5.11 Signalling and telecoms asset interventions are currently being carried out in accordance with the manufacturer's recommendations and standards adapted from SNCF and NRIL. Renewal options have yet to be determined as the signalling system life is expected to be 25 years, subject to manufacturer's on-going support with spare parts etc. Managing obsolescence is a key priority in the short to medium-term as the signalling technology may change significantly by the renewal date. The advancement of ERTMS will largely determine the new shape of the signalling architecture.

5.12 GSM-R is currently being implemented on the HS1 network and should be completed in 2015. The HS1 network currently uses a cab secure radio ("CSR") system between the signaller and driver to pass operational messages. The CSR will be removed once GSM-R is installed in 2015.

5.13 Civil engineering asset inspections have revealed that some remedial works will be required within control period 2 commencing 1st April 2015. Remedial works to the viaducts, Choats Manor Way Bridge and River Medway drainage and outfall works have been scheduled to address these issues.

5.14 For the electrification assets there are no major renewals interventions expected in the near future. Initial estimates envisage a replacement programme for OLE assets to commence within 15 to 20 years from installation date (based on manufacturer's recommendations). However, on the basis of recent benchmarking work from SNCF and NRIL and anticipated pantograph passes, this figure has now been revised to a 25 to 30 year horizon based on current wear rates and predicted traffic patterns.

6. Safety

Overview

6.1 Under the Railways and Other Guided Transport Systems (Safety) Regulations 2006, the infrastructure manager, NR(HS), has duties to establish and maintain a safety management system as set out in the Regulations. NR (HS) was issued with a safety authorisation in accordance with the Regulations in October 2009, which was renewed in March 2012 for a period of five years.

Safety activities during 2013/14

6.2 There were no specific inspections carried out on the HS1 network during the work year. There was supervision through liaison meetings with HS1 Ltd and NR(HS) staff and monitoring of incidents in their daily log, and involvement in a number of issues as set out in the next paragraphs.

6.3 ORR attended emergency exercises which covered recovery of a failed freight train and a simulated buffer stop collision at St Pancras. Both exercises were well organised and successful with some learning points from each. The exercises are designed to test the emergency planning process.

6.4 The HS1 infrastructure continues to perform well with no major defects identified. NR(HS) and HS1 Ltd continue to negotiate with SNCF for the use of the IRIS 320 track measuring train. This will enable dynamic measurement of the track at linespeed which is unavailable with current measuring trains operating in the UK.

6.5 SNCF now has safety certification issued by ORR for the track measuring train when it is hauled by Krupp locos and when in self-propelled mode. For the latter the on-board TVM system still requires some modification. In hauled mode the unit is limited to 100 kph being the maximum speed attainable with the Krupp locos.

6.6 Ashford International Station is now operated under the safety authorisation granted to Mitie Technical Facilities Management Ltd who obtained their authorisation and licence from ORR. Eurostar International Ltd remains the only international train operator using the station.

Proposed safety activities for 2014/15

6.7 The following safety activities are proposed for 2014/15:

- (a) inspection of the management of Multi-Purpose Vehicles by the contractor working for HS1 Ltd;
- (b) regular liaison meetings with NR(HS) during the year; and
- (c) investigations of incidents in accordance with ORR's processes.

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